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### NOTES ON THE DIET OF THE APLOMADO FALCON (*FALCO FEMORALIS*) IN NORTHCENTRAL CHILE

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The Aplomado Falcon (*Falco femoralis*) is distributed from the southwestern United States south throughout South America to Tierra del Fuego (Cade 1982). Aplomado Falcons inhabit open savannas and desert grasslands, from coastal plains at sea level to elevations up to 4000 m in the Andes (Johnson 1965, Hector 1985). In Chile the Aplomado Falcon was considered uncommon throughout its range (Goodall et al. 1951), but more recently, Jakšić and Jiménez (1986) reevaluated its status as frequent in northern Chile, rare and increasing in the center of the country, and scarce in the south.

Despite the Aplomado Falcon's wide distribution in the Americas, its biology is still little known. Most accounts of the species deal with anecdotal descriptions of its feeding habits (see Hector 1981 and references therein). An exception is the detailed study of the diet and hunting behavior of *F. f. septentrionalis* in northern Mexico (Hector 1985, 1986) whose quantitative analysis of the falcon's diet revealed its mainly ornithofagous feeding habits, supplemented with large insects.

Here, I describe the diet of Aplomado Falcons in a locality of northcentral Chile, the first such investigation in South America. I then compare the findings with those of Hector (1985, 1986) in Mexico.

#### STUDY AREA AND METHODS

The study area encompassed the 4570 ha Chinchilla National Reserve (31°31'S 71°06'W) at Aucó and its surroundings. The reserve lies close to the town of Illapel, 300 km north of Santiago in northcentral Chile. The climate is semi-arid and the topography of the site is rugged with deep gorges and steep slopes (>15°) interspersed with flatlands and broad, open ravines with gentle slopes (<15°). The latter habitat types made up 23.2% of the Aucó surface (corrected by slope). The semi-desert vegetation is dominated by thorny deciduous shrubs with sparse cacti and bromeliads on the more rocky north-facing slopes. Grasses, herbs, small shrubs, and bare soil dominate the flatter areas (see Jiménez et al. 1992).

Aplomado Falcons are uncommon at Aucó; however, they can be seen at least once a month all year round, either alone or in pairs, mostly using flatlands and rolling hills. During 1991, two pairs nested close to the Reserve (B. Peña pers. comm.).

Between 26 January and 8 February 1992, I collected prey remains and pellets under perches and plucking sites used by Aplomado Falcons. The data collection period was after the breeding season (Jiménez pers. obs., Johnson 1965).

I identified the collected material by comparing it with voucher specimens from the Chilean Museum of Natural History. I used Hector's (1985: 337) method to determine the number of individuals taken. Prey weights were derived from Jiménez and Jakšić (1989a, 1989b) supplemented with personal field records. I assumed all insects weighed 1 g; a conservative estimate for the large insects typically captured. Geometric mean prey weights were calculated (Hector 1986, Jiménez and Jakšić 1989a).

#### RESULTS AND DISCUSSION

I found three pellets and abundant feathers, representing 40 individual prey items. Because of the small sample size conclusions should be drawn with caution.

Aplomado Falcons at Aucó hunted primarily birds (55.5% of total prey by number), followed by insects (42.5%; Table 1). Only one reptile, a lizard, was identified from prey remains. When considering prey weight, the rank order of the prey taken by the falcons did not change, but the relative importance of birds in the diet increased dramatically from 55.5–96.7%. Insects made up an insignificant amount of the prey biomass (1.7%).

In general, my results are consistent with previous qualitative (Housse 1945, Johnson 1965) and quantitative (Hector 1985, 1986) reports on the diet of Aplomado Falcons. In contrast to Cade (1982), Chilean Aplomado Falcons did not hunt small mammals, although two diurnal rodent species (*Akodon olivaceus* and *Octodon degus*) occur at the site and are taken by eight other local raptors and by two foxes (Jakšić et al. 1992). Thus, this falcon is the only vertebrate predator at Aucó which apparently does not hunt mammals.

At Aucó, Aplomado Falcons captured at least 11 bird species belonging to four orders and seven families (Table 1). The frequency of the birds captured was relatively

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Table 1. Prey taken by Aplomado Falcons in Aucó, northcentral Chile. Numbers in parentheses are for prey classes. The bird nomenclature follows Araya and Millie (1989). The geometric mean weight for birds and for total prey were computed (mean  $\pm$  SD).

	PREY WEIGHT (g) <sup>a</sup>	NUMBER OF INDI- VIDUALS	% OF DIET	
			NUMBER	BIOMASS
<b>Birds</b>	(34.29 $\pm$ 1.77)	(22)	(55.5)	(96.7)
Black-winged Ground-Dove, <i>Metriopelia melanoptera</i>	125 <sup>b</sup>	1	2.5	13.4
Band-winged Nightjar, <i>Caprimulgus longirostris</i>	45 <sup>c</sup>	1	2.5	4.8
Giant Hummingbird, <i>Patagona gigas</i>	16 <sup>c</sup>	1	2.5	1.7
White-throated Tapaculo, <i>Scelorchilus albicollis</i>	60 <sup>d</sup>	1	2.5	6.4
Fire-eyed Diucon, <i>Pyrope pyrope</i>	38 <sup>d</sup>	1	2.5	4.1
Chilean Mockingbird, <i>Mimus thenca</i>	66 <sup>d</sup>	2	5.0	14.2
Long-tailed Meadowlark, <i>Sturnella loyca</i>	113 <sup>d</sup>	1	2.5	12.1
Mourning Sierra-finch, <i>Phrygilus fruticeti</i> , male	32 <sup>d</sup>	1	2.5	3.4
female	26 <sup>c</sup>	4	10.0	11.1
Band-tailed Sierra-finch, <i>Phrygilus alaudinus</i>	18 <sup>d</sup>	2	5.0	3.9
Diuca-finch, <i>Diuca diuca</i>	25 <sup>c</sup>	4	10.0	10.7
Rufous-collared Sparrow, <i>Zonotrichia capensis</i>	19 <sup>d</sup>	1	2.5	2.1
Passeriformes, unidentified	41 <sup>e</sup>	2	5.0	8.8
<b>Reptiles</b>		(1)	(2.5)	(1.6)
Rough-scaled lizard, <i>Liolaemus nitidus</i>	15 <sup>d</sup>	1	2.5	1.6
<b>Insects</b>		(17)	(42.5)	(1.7)
Scarabaeidae, unidentified	1	1	2.5	0.1
Bostrichidae, unidentified	1	1	2.5	0.1
Tenebrionidae, unidentified	1	3	7.5	0.3
Carabidae, unidentified	1	2	5.0	0.2
Chagual moth, <i>Castnia psittacus</i>	1	5	12.5	0.5
Sphecidae, unidentified	1	1	2.5	0.1
Cicadidae, unidentified	1	3	7.5	0.3
Gryllidae, unidentified	1	1	2.5	0.1
<b>Total prey</b>	(7.48 $\pm$ 6.08)	(40)	(100)	(100)

<sup>a</sup> Weight sources: <sup>b</sup> = after Jiménez and Jakšić (1989b); <sup>c</sup> = Jiménez (unpubl.); <sup>d</sup> = after Jiménez and Jakšić (1989a); <sup>e</sup> = weight estimated as the geometric mean weight of known avian prey. Insects were assumed to weigh 1 g.

evenly distributed among species, although only 30% of the 37 potential avian prey species in Aucó were hunted by Aplomado Falcons (Jiménez and Jakšić 1989a). It is surprising that no tinamu (*Nothoprocta perdicaria*) was captured because the species is very abundant at the site (pers. obs.), and has been described elsewhere as the preferred prey of Aplomado Falcons (Housse 1945, Johnson 1965). In northcentral Chile, Aplomado Falcons take fewer insectivorous birds (one species out of 10) and relatively more seed-eating species. Conversely, in Mexico, most prey of Aplomado Falcons are insectivorous birds (Hector 1985). The fact that Chilean Aplomados take fewer insectivorous birds, as well as fewer insects, may have important conservation-related implications. Aplomado Falcons in Chile may be relatively less affected by the organochlorine pesticides still in use than are Mexican falcons (Kiff et al. 1980).

The importance of insects in the diet of Aplomado Falcons is underestimated when biomass is considered. However, the 1 g weight assumption for insect prey may be too low; insects taken were quite large, especially the chagual moths (*Castnia psittacus*). As reported by Hector (1985) for Mexican Aplomado Falcons, the most common insect prey for the Chilean birds were moths and cicadas.

The geometric mean weight of prey taken at Aucó is much smaller than that for Mexican Aplomado Falcons (Hector 1981; 7.48 vs. 23.8 g, respectively; Table 1). However, the figure for bird prey is remarkably close to the one found for male Mexican Aplomado Falcons (Hector 1986): 34.29 vs. 34.98 g, respectively.

Although the sample size is small, this study shows that Aplomado Falcons rely mostly on avian prey, apparently paying no attention to potential mammalian prey. Insects made a minute amount of these falcons' diet. The results

of this study agree well with another quantitative study conducted in the northern end of the Aplomado Falcon distribution.

**RESUMEN.**—A base de restos de presas y contenidos de egagrópilas se estudia la dieta del halcón perdiguero (*Falco femoralis*) en la localidad de Aucó (31°31'S 71°06'W), en Chile centronorte. Tanto en número como en biomasa, las presas más abundantes son las aves (55,5 y 96,7%, respectivamente). Los insectos sólo son importantes desde el punto de vista numérico (42,5%), pero su contribución en biomasa es casi nula (1,7%). La presencia de reptiles en la dieta es escasa y los mamíferos no son consumidos por estos halcones. Comparados con halcones perdigueros mexicanos, los estudiados en Chile tienen una dieta muy similar en los tipos y tamaños de las presas consumidas. Sin embargo, los perdigueros chilenos consumen menos aves insectívoras y más granívoras que los mexicanos.

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